

REMARKS

This paper is being presented in response to the non-final official action dated June 15, 2006, wherein: (a) claims 1-52 are pending; (b) claims 17-39 and 50-52 have been withdrawn from further consideration in view of the restriction requirement imposed in the March 3, 2006, official action, made final herein; (c) claims 1-6 and 13-16 have been rejected under 35 USC § 102(b) as being anticipated by each of Benesi U.S. Patent No. 6,491,817 and Benesi U.S. Patent No. 6,521,135; (d) claims 40-49 have been rejected under § 102(b) as being anticipated by Hansen et al. U.S. Patent No. 5,004,860; and, (e) claims 7-12 have been rejected under 35 USC § 103(a) as being obvious over the '817 patent or the '135 patent. Reconsideration and withdrawal of the rejections are respectfully requested in view of the foregoing amendments and following remarks.

This paper is timely filed as it is accompanied by a petition under 37 CFR § 1.136(a) for an extension of time to file in the first month, and payment of the required extension fee.

I. Brief Summary of the Amendments to the Claims

Dependent claims 3 and 4 have been canceled and the features recited therein have been incorporated into independent claim 1. Support for the amendments to claim 1, therefore, may be found in the canceled claims of the application as originally filed. No new subject matter has been introduced into the application by the foregoing amendments.

II. The 35 USC § 102(b) Rejections

Claims 1-6 and 13-16 have been rejected under 35 USC § 102(b) as being anticipated by each of Benesi U.S. Patent No. 6,491,817 and Benesi U.S. Patent No. 6,521,135, and claims 40-49 have been rejected under § 102(b) as being anticipated by Hansen et al. U.S. Patent No. 5,004,860:

Claim Rejections - 35 USC § 102

Claims 1-6 and 13-16 are rejected under 35 U.S.C. 102(a) as being anticipated by Benesi (either of US 6,491,817 or 6,521,135). See the Figures.

Claims 40-49 are rejected under 35 U.S.C. 102(b) as being anticipated by Hansen (US 5,004,860). See the disclosed "slurry filter units."

The Action at p. 4. A response to the anticipation rejections is set forth below.

A. Proper Basis for a § 102(b) Rejection

"A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." *Verdegaal*

Bros. v. Union Oil Co. of California, 814 F.2d 828, 631 (Fed. Cir. 1987). Thus, a determination that a claim is anticipated under 35 USC § 102 involves two analytical steps. First, the U.S. Patent and Trademark Office (PTO) must interpret the claim language, where necessary, to ascertain its meaning and scope. In interpreting the claim language, the PTO is permitted to attribute to the claims only their broadest *reasonable* meaning as understood by persons having ordinary skill in the art, considered in view of the entire disclosure of the specification. See *In re Morris*, 127 F.3d 1048, 1054 (Fed. Cir. 1997). Second, the PTO must compare the construed claim to a single prior art reference and set forth factual findings that "each and every limitation is found either expressly or inherently [disclosed] in [that] single prior art reference." *Celeritas Techs. Ltd. v. Rockwell Int'l Corp.*, 150 F.3d 1354, 1360 (Fed. Cir. 1998). Additionally, "[t]he identical invention must be shown in as complete detail as is contained in the patent claim." *Richardson v. Suzuki Motor Co.*, 858 F.2d 1226, 1236 (Fed. Cir. 1989).

B. The § 102(b) Rejection Are Traversed

The pending claims, of which only claims 1 and 40 are independent, recite methods of separating solids from liquids:

1. [As amended] A process for separating solids from liquids in a filtration zone defining a higher concentration zone and a lower concentration zone separated by a filter, the process comprising the steps of:
(a) flowing a slurry feed comprising a liquid and a solid into the higher concentration zone;
(b) flowing a displacement fluid to the higher concentration zone countercurrent to the flow of the slurry feed; and
(c) removing at least a portion of the liquid through the filter to the lower concentration zone, producing a filtrate;
wherein the displacement fluid displaces at least a portion of the liquid from the slurry feed.

40. A solid-liquid separation process, comprising:
(a) providing a filter column comprising a hollow cylinder and at least one filter tube extending in an axial direction within the hollow cylinder, wherein at least one tube comprises an integrally attached filter, the filter forming a direct connection between an interior of the tube and an interior of the hollow cylinder;
(b) directing a slurry feed into the hollow cylinder; and
(c) directing a displacement fluid into the hollow cylinder.

The applicants respectfully submit that the rejected independent claims (and rejected claims dependent therefrom) are not anticipated by any of the Benesi or Hansen patents because

none of these patents individually discloses all of the features recited in the rejected claims. *Verdegaal Bros.*, 814 F.2d at 631 ("A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference."). Moreover, none of these patents discloses the invention in as complete detail as is recited in the rejected claims. See *Richardson*, 868 F.2d at 1236 (stating that "[t]he identical invention must be shown in as complete detail as is contained in the patent claim").

1. The Benesi Patents Do Not Anticipate the Rejected Claims

The action directs the applicants to "the Figures" of the Benesi patents as the sole basis for supporting the anticipation rejection of claims 1-6 and 13-16. The Benesi '817 patent includes 30 figures, while the Benesi '135 patent includes 4 figures. Notwithstanding the sheer number of figures present in the Benesi patents, neither the figures nor the text in the Benesi patents anticipates the rejected claims as amended herein. Consequently, the rejection is traversed.

The Benesi patents are directed to a method for extracting liquids from a wet slurry, and for producing a substantially dry filter cake of the solid materials present in the slurry. The '817 patent at col. 1, lines 17-21; the '135 patent at col. 1, lines 18-22. Neither of these patents, however, discloses "flowing a displacement fluid ... countercurrent to the flow of the slurry fluid," as recited in amended, independent claim 1 (and all claims dependent therefrom).

The Benesi '817 patent discloses uniformly introducing a slurry through a distributor into an open filter chamber until the chamber is full. See, e.g., Benesi '817 patent at col. 5, lines 16-37 (conduit 110 (Fig. 1), transfer conduit 130 (Figs. 2-4, 6), transfer conduit 134 (Figs. 5, 7, and 8)). Thereafter, the Benesi '817 patent teaches that the filter executes a series of programmed operations, where gravity and pressurized fluids (flowing in the same *direction* as the slurry) force the fluid present in the slurry through a filter leaving behind a substantially dry filter cake atop the filter. Once these programmed operations are complete, the chamber is opened so that the substantially dry filter cake may be removed. See the Benesi '817 patent at col. 5, line 49 to col. 6, line 6.

The Benesi '135 patent discloses the same solid/liquid filtration process as is disclosed in the Benesi '817 patent, but focuses on the programmed operation of removing the liquid present in the slurry with wash fluids. Specifically, Figure 1 of the Benesi '135 patent and the accompanying text teach the skilled artisan that a single inlet pipe conveys the slurry and various wash fluids into a filtration chamber—in the same direction of flow as the slurry feed—wherein valves control the flow of the slurry and various wash fluids. The Benesi '135 patent at col. 5, lines 13-46.

The Benesi patents disclose only a batch filtration process and neither discloses nor suggests how its apparatus and process could be modified to accommodate a continuous process that flows "a displacement fluid... countercurrent to the flow of the slurry fluid," as recited in amended, independent claim 1 (and all claims dependent therefrom). The applicants submit that the batch processes disclosed in the Benesi patents cannot be modified to operate in a manner where a displacement fluid flows countercurrent to the flow of the slurry feed to be filtered. The action does not identify disclosure in the Benesi patents of each and every feature recited in amended, independent claim 1. See *Verdegaal Bros.*, 814 F.2d at 631 ("A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference."). Consequently, the anticipation rejection of pending claims 1, 2, 5, 6, and 13-16 is traversed, and reconsideration and withdrawal of the rejection are respectfully requested.

2. The Hensen Patent Does Not Anticipate the Rejected Claims

Contrary to the action's conclusion, the Hensen patent's disclosure of "slurry filter units," does not anticipate independent claim 40 or any claim dependent therefrom. Independent claim 40 recites "directing a slurry feed into the hollow cylinder." In contrast to that recitation, the Hensen patent clearly discloses a filtration process that passes a liquid-crystal slurry through one or more porous metal tubes 164. Liquid present in the slurry passes from the tubes 164 through the tubes' porous holes and into the tank 166—the slurry *does not* pass into the tank 166. The Hensen patent clearly *does not* disclose or otherwise teach the skilled artisan to pass the slurry into the tank 166 in which the tubes 164 are disposed. The relevant text from the Hensen patent descriptive of the slurry filter units (shown in Figure 4 of the Hensen patent) is as follows:

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as shown to the differential pressure sensors 161, 163, the flow sensor 111, 112, and the valves 121, 122, 131, 132 and 151, 152.

As best shown in FIG. 4, each of the filter units 61, 62 comprises one or more porous metal tubes 164 through which the liquid-crystal slurry is pumped at a selected velocity. The number of tubes 164 is determined by the size of the separation unit 12. A pressure drop across the porous wall of each tube 164 is established by the amount of liquid filtrate withdrawn. The pressure drop 10 causes the liquid to flow through the pores of each porous filter tube 164, laterally outwardly to a tank 166 surrounding the tubes 164 and coupled to output lines 71, 72 via output lines 171, 172 for each filter unit 61 or 62. In time, the pores in the tubes 164 will become 15 clogged with small crystals and the pressure in the tubes 164 will build up. This creates a back pressure in the

The Hensen patent at col. 5, lines 4-13 (describing features shown in Figure 4).

The Hensen patent does not anticipate independent claim 40 (or any claim dependent therefrom) because the Hensen patent does not expressly or impliedly disclose each feature recited in independent claim 40. See *Verdegaal Bros.*, 814 F.2d at 631 ("A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference."). Consequently, the anticipation rejection of pending claims 40-49 is traversed, and reconsideration and withdrawal of the rejection are respectfully requested.

III. The 35 USC § 103(a) Rejection

Dependent claims 7-12 have been rejected under 35 USC § 103(a) as being obvious over each of Benesi U.S. Patent No. 6,491,817 and Benesi U.S. Patent No. 6,521,135:

Claim Rejections - 35 USC § 103

Claims 7-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Benesi (either of US 6,491,817 or 6,521,135).

These claims specify details of the slurry. Given the broad disclosure of Benesi, it is submitted that use of the system disclosed by Benesi to process the slurry now being claimed, would have been readily apparent to those skilled in the art.

The Action at p. 4. A response to the obviousness rejection is set forth below.

A. Proper Basis for a § 103(a) Rejection

The PTO "has the burden under § 103 to establish a prima facie case of obviousness." *In re Fine*, 837 F.2d 1071, 1074 (Fed. Cir. 1988). To establish a prima facie case of obviousness, the PTO must satisfy three basic criteria. First, the PTO must show that the combined disclosure of the prior art references teaches or suggests all of the claim limitations. See MPEP § 2143 (8th ed., Rev. 5, Aug. 2006). Moreover, it is "incumbent upon the examiner to identify wherein each and every facet of the claimed invention is disclosed in the applied reference." *Ex parte Levy*, 17 USPQ2d 1461, 1462 (Bd. Pat. App. & Inter. 1990).

Second, where obviousness is alleged to arise from a combination of elements across a plurality of references, the PTO must show the existence of some suggestion, motivation, or teaching to those skilled in the art to make the precise combination recited in the claims. See *Iron Grip Barbell Co. v. USA Sports, Inc.*, 392 F.3d 1317, 1320 (Fed. Cir. 2004). Compliance with this requirement prevents the PTO's use of "the inventor's disclosure as a blueprint for piecing together the prior art to defeat patentability—the essence of hindsight." *Ecotochem, Inc. v. Southern Cal. Edison Co.*, 227 F.3d 1361, 1371-72 (Fed. Cir. 2000) (quoting *In re Dembiczak*, 175 F.3d 994, 999 (Fed. Cir. 1999)). Evidence of a suggestion or motivation to combine prior art references may come from "the prior art

references themselves, the knowledge of one of ordinary skill in the art, or, in some cases, from the nature of the problem to be solved." *Brown & Williamson Tobacco Corp. v. Philip Morris Inc.*, 229 F.3d 1120, 1125 (Fed. Cir. 2000). The PTO's showing "must be clear and particular, and broad conclusory statements about the teaching of multiple references, standing alone, are not 'evidence.'" *Id.* (quoting *In re Dembiczek*, 175 F.3d at 1000). Indeed, the Court of Appeals for the Federal Circuit has consistently held that a person having ordinary skill in the art must not only have had some motivation to combine the prior art teachings, but also some motivation to combine the prior art teachings in the particular manner claimed. *See, e.g., In re Kotzab*, 217 F.3d 1365, 1371 (Fed. Cir. 2000) ("Particular findings must be made as to the reason the skilled artisan, with no knowledge of the claimed invention, would have selected these components for combination in the manner claimed.").

To support a conclusion that a claimed combination is *prima facie* obvious, either (a) the references must expressly or impliedly suggest the claimed combination to one of ordinary skill in the art, or (b) the PTO must present a convincing line of reasoning as to why a person of ordinary skill in the art would have found the claimed invention to have been obvious in light of the teachings of the references. *See Ex parte Clapp*, 227 USPQ 972, 973 (Bd. Pat. App. & Inter. 1985); *see also, In re Rinehart*, 531 F.2d 1048, 1051 (CCPA 1976). The mere fact that the prior art could be modified as proposed by the PTO is not sufficient to establish a *prima facie* case of obviousness. *See In re Fritch*, 972 F.2d 1260, 1266 (Fed. Cir. 1992). The PTO must explain why the prior art would have suggested to one of ordinary skill in the art the desirability of the modification. *Id.*; *In re Rouffet*, 149 F.3d 1350, 1357 (Fed. Cir. 1998) ("In other words, the examiner must show reasons that the skilled artisan, confronted with the same problems as the inventor and with no knowledge of the claimed invention, would select the elements from the cited prior art references for combination.").

Finally, the PTO must demonstrate that a person having ordinary skill in the art would have a reasonable expectation of success when combining the disclosures of the references. The suggestion or motivation to make the claimed invention and the reasonable expectation of success must both be found in the prior art, and must not be derived by hindsight from knowledge of the application's disclosure. *In re Dow Chem. Co.*, 837 F.2d 469, 473 (Fed. Cir. 1988); MPEP § 2143.

B. The § 103(a) Rejection is Traversed

The § 103(a) rejection of dependent claims 7-12 is premised on the PTO's position that claims 1 and 2, as examined, are anticipated by the Benesi patents. Section I, above, describes how claim 1 has been amended herein, and Section II.B.1, above, argues that amended claim 1 is not anticipated by the Benesi patents because those patents do not teach all of the features recited in amended claim 1 (from which claims 7-12 depend). Not only do

the Benesi patents not teach all of the features recited in claims 1 and 2, the Benesi patents also do not teach or suggest all of the limitations recited in claims 7-12. Furthermore, there is no evidence that the skilled artisan considering the Benesi patents and other prior art would have considered the subject matter recited in claims 7-12 obvious as of the application's filing date. No prima facie case of obviousness was made in the instant action, and none exists relative to the pending claims (as amended) based on the combination of the applied publications.

The action admits that the Benesi patents do not teach or suggest all of the features recited in claims 7-12. The action, however, summarily asserts that the disclosure in the Benesi patents is "broad" and that the "use of the system disclosed by Benesi to process the slurry [recited in the rejected claims] would have been readily apparent to those skilled in the art." The Action at p. 4. The action cites no evidence in support of these assertions.

The action also does not identify wherein each and every feature recited in claims 7-12 is disclosed in the prior art (i.e., in the applied references or within the knowledge of the ordinarily skilled artisan), in contravention of *Ex parte Levy*, 17 USPQ2d at 1462. The action also does not identify any showing of a suggestion, motivation, or teaching to those skilled in the art to make the precise combination recited in claims 7-12, in contravention of established legal precedent requiring such a showing. See, e.g., *Iron Grip Barbel*, 392 F.3d at 1320. Furthermore, the action does not present a convincing line of reasoning as to why a person of ordinary skill in the art would have found the invention recited in claims 7-12 to have been obvious in light of the "broad" teachings of the Benesi patents. Claims 7-12 define the slurry as, for example, products of a xylene isomers crystallization process. Slurry products of a xylene isomers crystallization process are sensitive to, among other things, temperature changes. The Benesi patent does not teach the skilled artisan how its process could be modified to accommodate temperature-sensitive slurries. Furthermore, even if the Benesi patents taught such a modification, those patents do not provide the skilled artisan with any reasonable expectation that the modification would succeed relative to products of a xylene isomers crystallization process.

Given the various shortcomings described above, the action has not set forth a prima facie case demonstrating the subject matter recited in claims 7-12 is obvious. Accordingly, the obviousness rejection of pending claims 7-12 is traversed, and reconsideration and withdrawal of the rejection are respectfully requested.

IV. Miscellaneous Remarks

In accordance with 37 CFR § 1.104(c)(2), the PTO must designate as nearly as practicable the specific parts of each supporting reference applied to establish a finding of obviousness. Section 1.104(c)(2) also states that "[t]he pertinence of each reference, if not

apparent, must be clearly explained and each rejected claim specified." It is respectfully submitted that the outstanding official action does not clearly explain the pertinence of each reference and the specific parts thereof applied to support the section 103(a) rejections. Indeed, the action does not even explain the pertinence of the references applied to support the anticipation rejections other than to direct the applicants to "the Figures" in each of the Benesi patents and the "slurry filter units" in the Hansen patent. Accordingly, it is respectfully submitted that the action does not comply with section 1.104(c)(2) and, therefore, the action is incomplete under 37 CFR § 1.104(b). Nevertheless, the applicants are submitting the foregoing response in a good faith effort to advance prosecution of the application. Having issued an incomplete action, the applicants respectfully request that the next action on the merits be made non-final.

CONCLUSION

In view of the foregoing, entry of amendments to the specification and drawings, cancellation of claims 3 and 4, entry of the amendment to claim 1, reconsideration and withdrawal of the rejections, and allowance of pending claims 1, 2, 5-16, and 40-49 are respectfully requested.

Should the examiner wish to discuss the foregoing, or any matter of form or procedure in an effort to advance this application to allowance, the examiner is urged to contact the undersigned attorney.

Respectfully submitted,

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October 16, 2006


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